查询MP4711供应商

TOSHIBA POWER MOS FET MODULE SILICON N CHANNEL MOS TYPE (L^2-π-MOS V 4 IN 1)

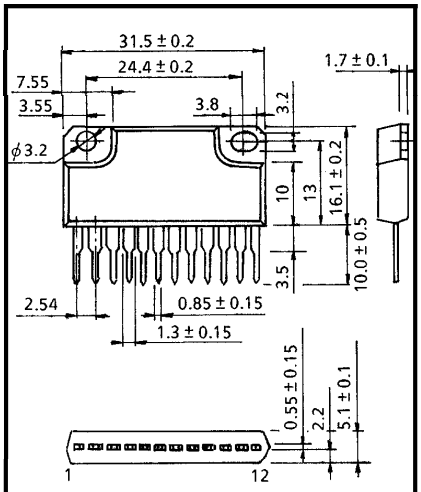
MP4711

HIGH POWER, HIGH SPEED SWITCHING APPLICATIONS
FOR PRINTER HEAD PIN DRIVER AND PULSE MOTOR DRIVER
FOR SOLENOID DRIVER

INDUSTRIAL APPLICATIONS

- 4 V Gate Drive Available
- Package with Heat Sink Isolated to Lead (SIP 12 Pin)
- High Drain Power Dissipation (4 Devices Operation)
  : P_T = 36 W (Tc = 25°C)
- Low Drain-Source ON Resistance : $R_{DS\,(ON)}$ = 0.17 Ω (typ.)
- High Forward Transfer Admittance : $|Y_{fs}|$ = 4.5 S (typ.)
- Low Leakage Current : I_{GSS} = ±10 μA (max.) (V_{GS} = ±16 V)
  I_{DSS} = 100 μA (max.) (V_{DS} = 100 V)
- Enhancement-Mode : V_{th} = 0.8~2.0 V
  (V_{DS} = 10 V, I_D = 1 mA)

Unit in mm

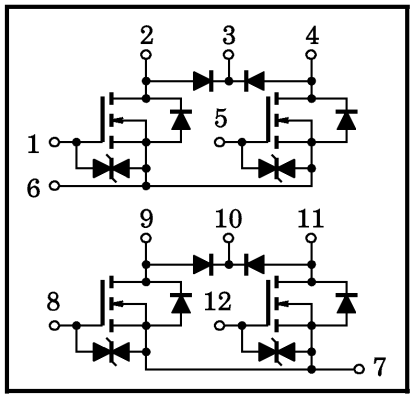


MOS FET		DIODE	
1, 5, 8, 12	GATE	2, 4, 9, 11	ANODE
2, 4, 9, 11	DRAIN	3, 10	CATHODE
6, 7	SOURCE		

JEDEC	—
EIAJ	—
TOSHIBA	2-32B1G

Weight : 6.0 g (typ.)

ARRAY CONFIGURATION



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Drain-Gate Voltage (R_{GS} = 20 kΩ)		V_{DGR}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC	I_D	5	A
	Pulse	I_{DP}	20	
Drain Power Dissipation (1 Device Operation, Ta = 25°C)		P_D	3.0	W
Drain Power Dissipation (4 Devices Operation)	Ta = 25°C	P_{DT}	5.0	W
	Tc = 25°C		36	
Single Pulse Avalanche Energy*		E_{AS}	180	mJ
Avalanche Current		I_{AR}	5	A
Repetitive Avalanche Energy**	1 Device Operation	E_{AR}	0.3	mJ
	4 Devices Operation	E_{ART}	0.5	
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	−55~150	°C

Note ;
* Avalanche energy (single pulse) applied condition
V_{DD} = 25 V, Starting T_{ch} = 25°C, L = 11.6 mH, R_G = 25 Ω, I_{AR} = 5 A
** Repetitive rating ; Pulse Width Limited by maximum channel temperature.

This transistor is an electrostatic sensitive device. Please handle with caution.

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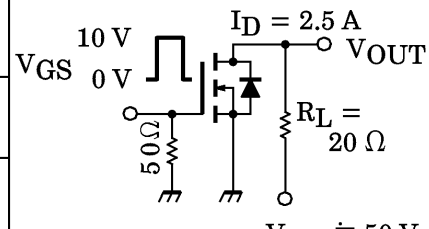
THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Channel to Ambient (4 Devices Operation, Ta = 25°C)	$\Sigma R_{th\ (ch\text{-}a)}$	25	°C / W
Thermal Resistance of Channel to Case (4 Devices Operation, Tc = 25°C)	$\Sigma R_{th\ (ch\text{-}c)}$	3.47	°C / W
Maximum Lead Temperature for Soldering Purposes (3.2 mm from Case for t = 10 s)	T_L	260	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	V_{GS} = ±16 V, V_{DS} = 0 V	—	—	±10	μA
Drain Cut-off Current		I_{DSS}	V_{DS} = 100 V, V_{GS} = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	I_D = 10 mA, V_{GS} = 0 V	100	—	—	V
Gate Threshold Voltage		V_{th}	V_{DS} = 10 V, I_D = 1 mA	0.8	—	2.0	V
Drain-Source ON Resistance		$R_{DS\ (ON)}$	V_{GS} = 4 V, I_D = 2.5 A	—	0.22	0.30	Ω
			V_{GS} = 10 V, I_D = 2.5 A	—	0.17	0.23	
Forward Transfer Admittance		$\|Y_{fs}\|$	V_{DS} = 10 V, I_D = 2.5 A	2.0	4.5	—	S
Input Capacitance		C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz	—	500	—	pF
Reverse Transfer Capacitance		C_{rss}		—	80	—	
Output Capacitance		C_{oss}		—	190	—	
Switching Time	Rise Time	t_r		—	17	—	ns
	Turn-on Time	t_{on}		—	25	—	
	Fall Time	t_f		—	50	—	
	Turn-off Time	t_{off}		—	195	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	V_{DD} ≒ 80 V, V_{GS} = 10 V, I_D = 5 A	—	22	—	nC
Gate-Source Charge		Q_{gs}		—	15	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	7	—	

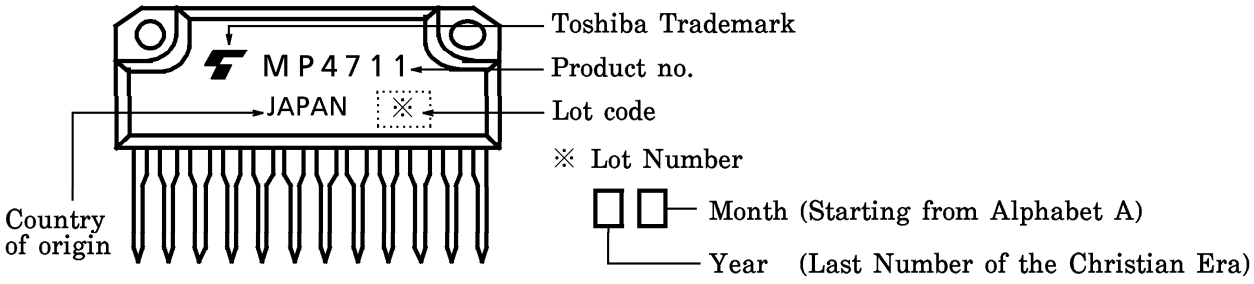
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	5	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	20	A
Diode Forward Voltage	V_{DSF}	I_{DR} = 5 A, V_{GS} = 0 V	—	—	−1.7	V
Reverse Recovery Time	t_{rr}	I_{DR} = 5 A, V_{GS} = 0 V, dI_{DR}/dt = 50 A / μs	—	160	—	ns
Reverse Recovery Charge	Q_{rr}		—	0.28	—	μC

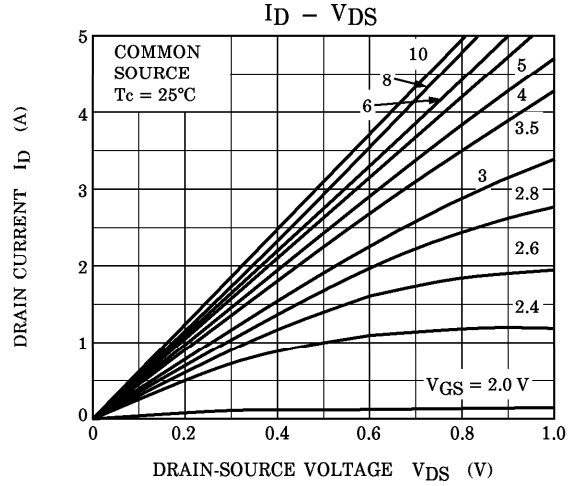
FLYBACK-DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Forward Current	I_{FM}	—	—	—	5	A
Reverse Current	I_R	V_R = 100 V	—	—	0.4	μA
Reverse Voltage	V_R	I_R = 100 μA	100	—	—	V
Forward Voltage	V_F	I_F = 2 A	—	—	2.3	V

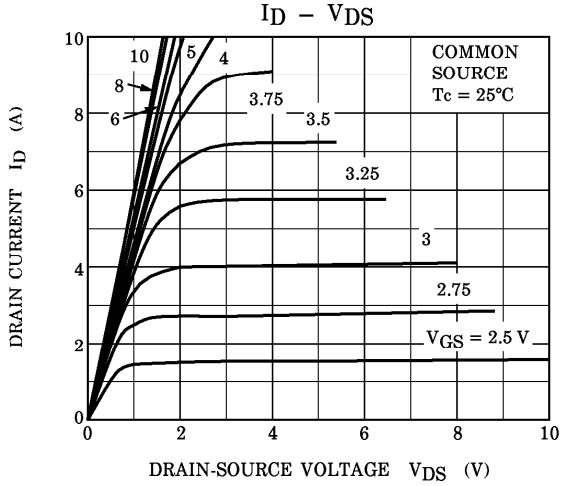
MARKING



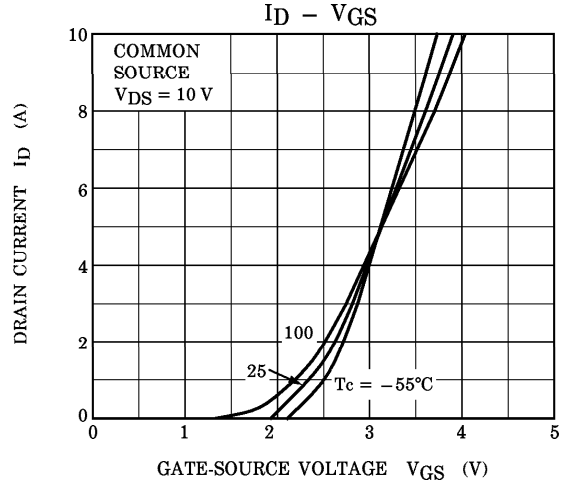
$I_D - V_{DS}$



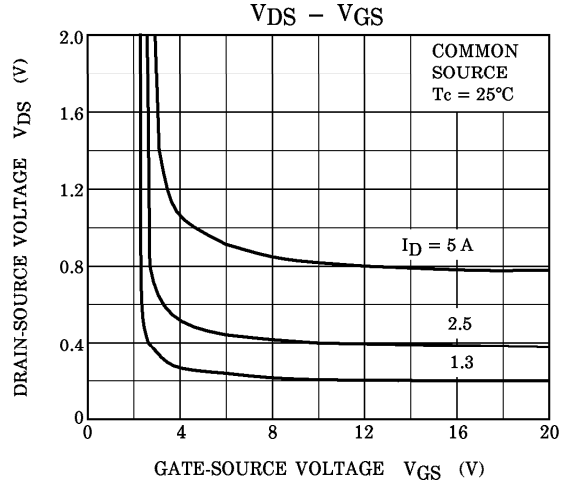
$I_D - V_{DS}$



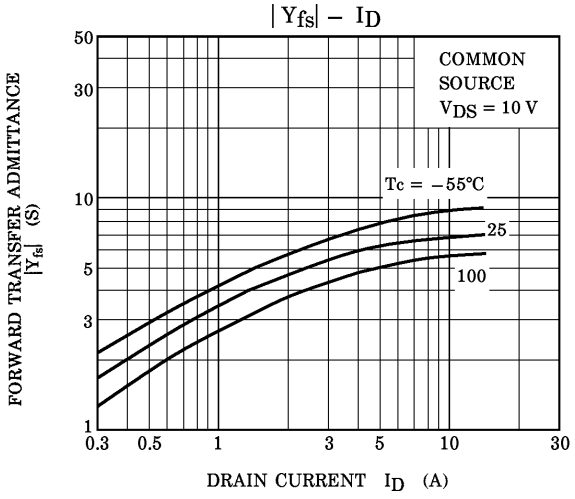
$I_D - V_{GS}$



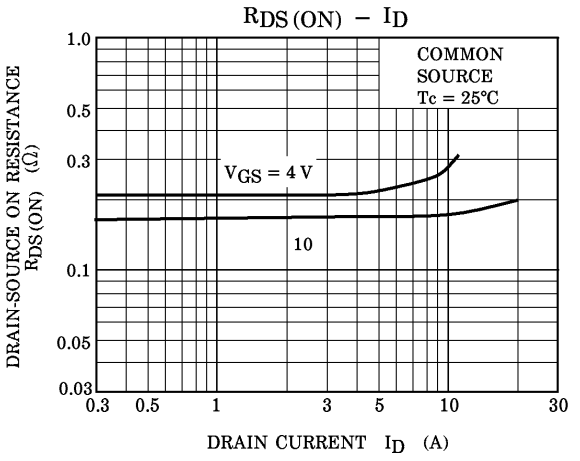
$V_{DS} - V_{GS}$



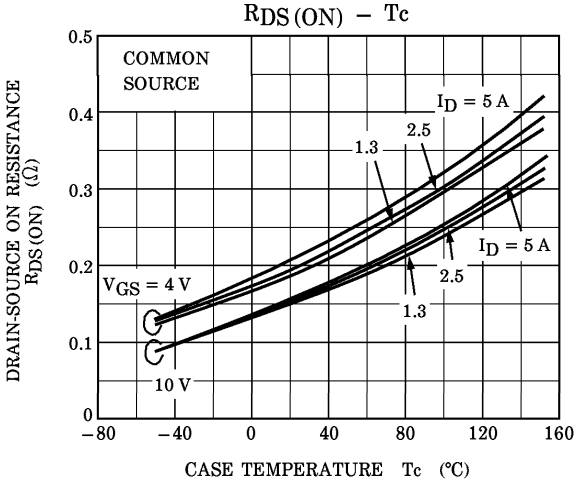
$|Y_{fs}| - I_D$



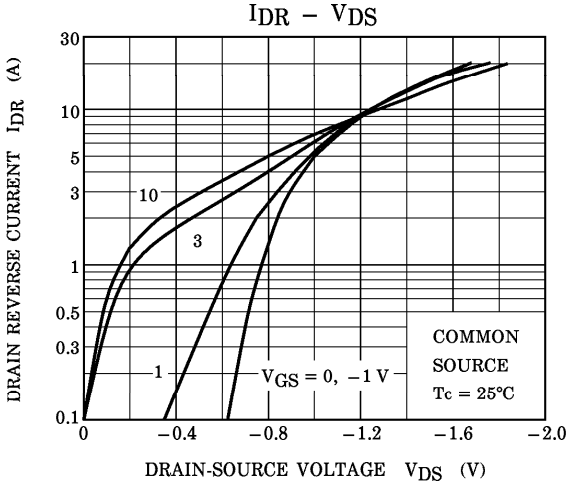
$R_{DS(ON)} - I_D$



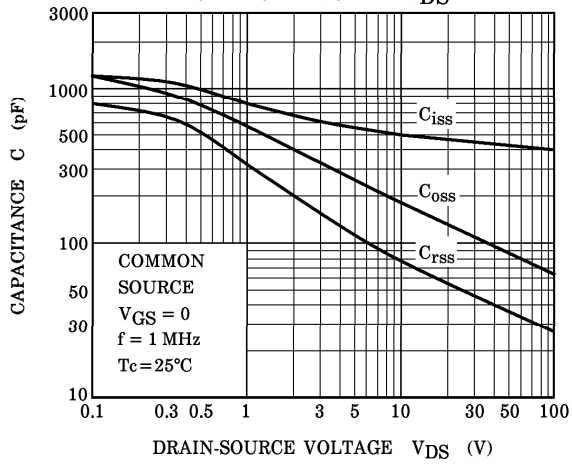
$R_{DS(ON)}$ – Tc



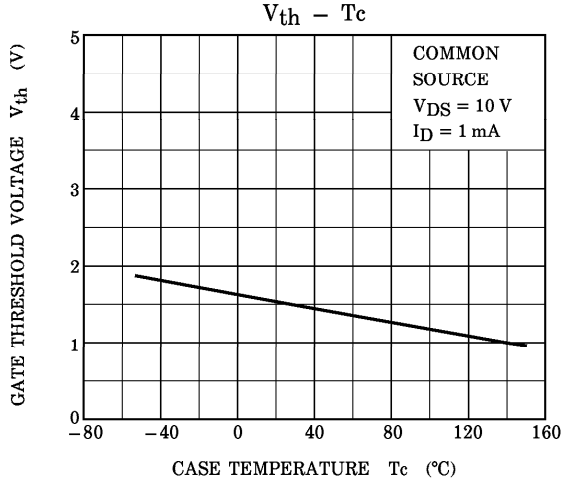
I_{DR} – V_{DS}



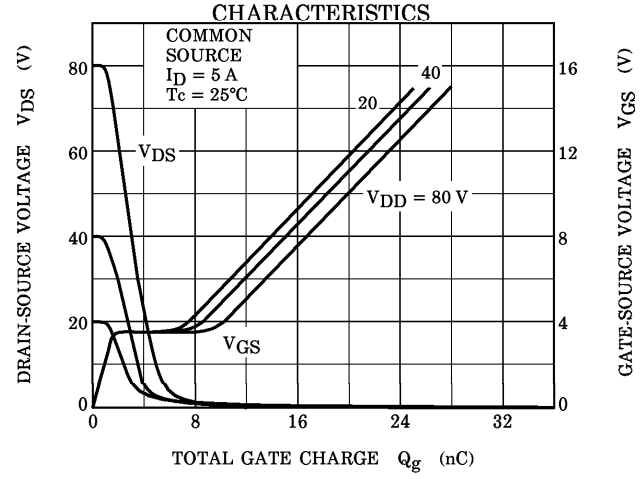
CAPACITANCE – V_{DS}



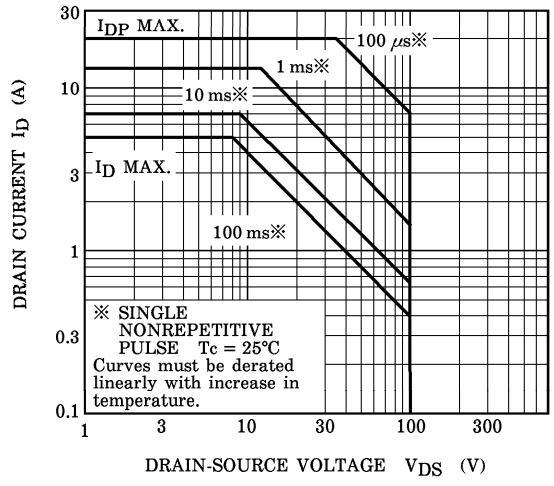
V_{th} – Tc



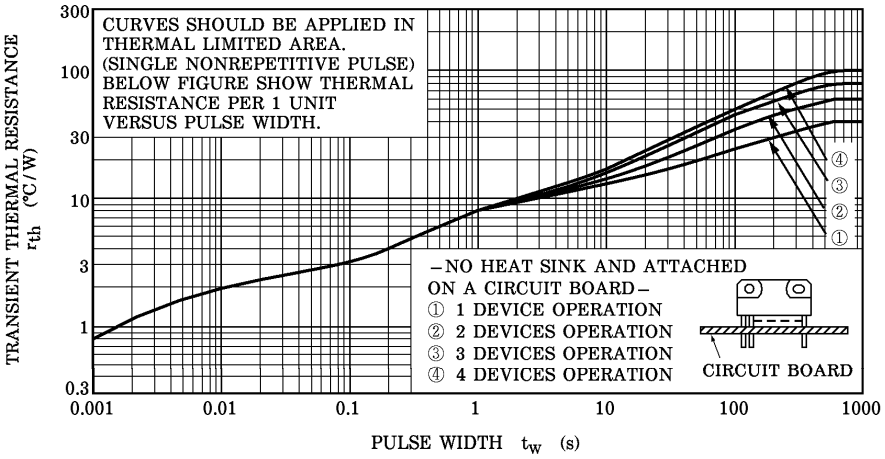
DYNAMIC INPUT / OUTPUT CHARACTERISTICS



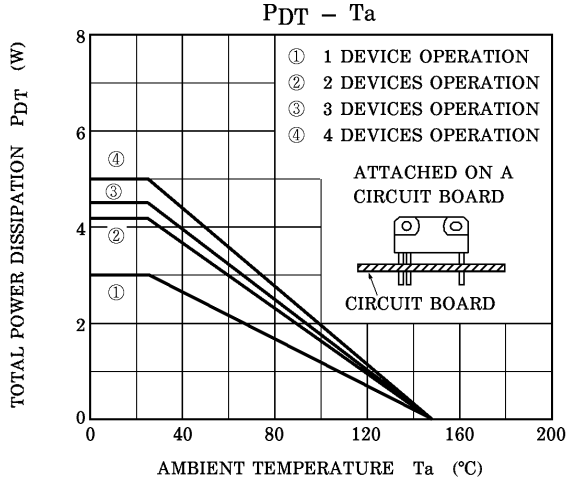
SAFE OPERATING AREA



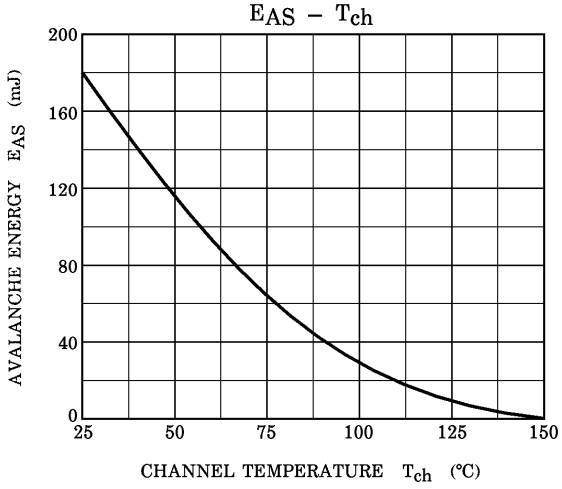
r_{th} – t_w



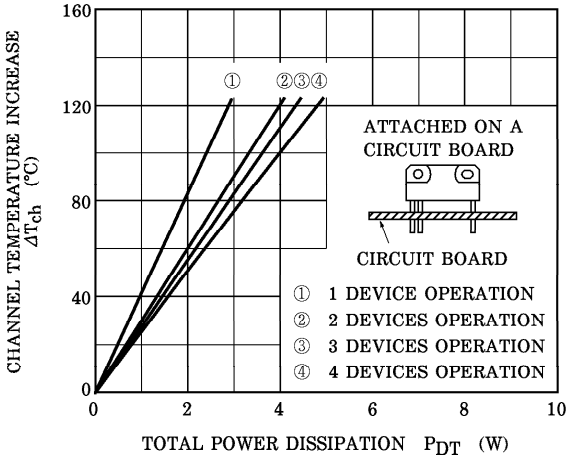
P_{DT} – Ta

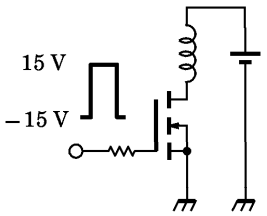


E_{AS} – T_{ch}

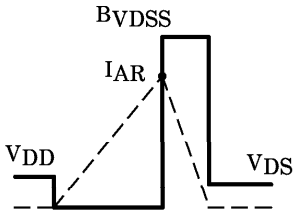


ΔT_{ch} – P_{DT}





TEST CIRCUIT



TEST WAVE FORM

Peak I_{AR} = 5 A, R_G = 25 Ω
V_{DD} = 25 V, L = 11.6 mH

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$$